JOINT LAND, WASTE & WATER QUALITY
ADVISORY BOARD MEETING
4th Quarter Meeting Minutes

November 14, 2001
Natrona County Fairgrounds
Arena Classroom
Casper, Wyoming

LQD BOARD MEMBERS PRESENT:

Marshall Gingery - Chairman
Chet Skilbred - Vice-Chairman
Rodney Proffitt
Larry Munn
Jim Gampetro

WASTE/WATER BOARD MEMBERS PRESENT:

Gene George - Chairman
Lorie Cahn
Joseph Graham
Harry LaBonde
Dr. Quentin Skinner

DEQ STAFF PRESENT:

Rick Chancellor
Roberta Hoy
Georgia Cash
Mark Moxley
Steve Ingle
Gary Beach
Paige Smith
Sandra Garcia
Don McKenzie
Mark Taylor
Glenn Mooney
Bill Dirienzo

MINUTES APPROVED BY LQD BOARD:

_____ **DATE:** _____

LQD Chairman signature - Marshall Gingery

MINUTES APPROVED BY WQD/WASTE BOARD:

_____ **DATE:** _____

WQD/Waste Chairman signature - Gene George

IN SITU GROUNDWATER CLASSIFICATION AND RESTORATION

GARY BEACH, WQD: In the WQ Chapter 8 groundwater regulations, if you turn to page 5, Section 4 (d) talks about how you classify groundwaters in the State of Wyoming. We have a classification system in our WQD regulations that talks about Class I waters which are generally those high class waters that are used for domestic drinking. They have the best quality of water.

Then we have Class II waters which are used for agricultural purposes where you may draw water to irrigate for agriculture.

We have Class III waters which are used for livestock.

We have Class IV waters which are in many cases special waters. It may be waters for body systems like fisheries.

Then we have Class V waters which are generally waters which are unsuitable for other than industrial purposes.

We have a classification system in our rules and we use that in the State of Wyoming to classify groundwaters, primarily in the case that we're talking about today, so that we then can begin to make a judgement on restoring those aquifers if they've been polluted. In this case, by the process of in situ mining.

There is a clause under Section 5 (a) on page 8. It talks about technical practicability and economic reasonableness of treating ambient water quality to meet use suitability standards. This has been interpreted to mean that if it's technical to treat a parameter then you should use a higher class of water when you're classifying. Let me give you an example: let's say that we have a water that, except for one parameter, would be a Class I water. Let's use radium since that's the one we're talking about today. Often times in uranium deposits you'll find radium higher and that makes sense because you've got uranium in those aquifers. You'll find radium higher than the standard. The standard is 5 picoCuries per liter (pCi/l). Let's assume radium was 50 picoCuries per liter but when you look at the classification system, all the other parameters would classify that water as a Class I suitable for drinking except for radium. In the past we have said that if there is a economical treatment system that could remove radium down to a level to the 5 picoCuries per liter so it would be suitable for drinking, then we will protect that water as a Class I water. In the past we have used the simple device of home treatment like a salt removal system and water softening system as a way that you could remove radium from the water and make it potable for use. With that in mind, we have concluded in the past that those waters up to 100 picoCuries per liter, because we felt a simple home softening system could remove up to 100 picoCuries per liter, could remove the radium and therefor make that water a Class I water. More recently, and I think primarily at the encouragement of the industry, we have rethought that policy. When we looked at the policy and reviewed it again, what we realized is if someone had a system like that in their home and they were removing radium, what they would be generating is a hazardous waste. They would be generating a radio-active waste and probably there may be some gas radium by-products associated with that. I think in our reevaluation of our consideration of is it economical and reasonable to treat radium, we have concluded that probably a wise person would not be doing that for the reasons that you would essentially, in your water softener, be developing a radio-active waste. Then you'd have to remove that material and somehow deal with that waste. Our suggestions have been that we remove the treatability product or radium from our policy. That's the primary change that you'll see in this.

The other change is to clarify the classification. Once an applicant comes in and proposes a project to in situ mine the uranium, we have to do two things: 1) we have to get an aquifer exemption from the US Environmental Protection Agency which essentially says this aquifer is exempt from protection as a drinking water source and, 2) it has to meet certain conditions to get that exemption. Essentially we have to find it. It isn't usable as a drinking water source. I think if you look at the mineralization of that aquifer, that's how you justify that exemption.

We also, simultaneously through our regulations, reclassify that aquifer to be a Class V mineral commercial aquifer under the requirement of (d)(viii)(B) on page 7 of the WQ Rules and Regulations, Chapter 8, which talks about discharges into a Class V mineral commercial *groundwater of the State shall be for the purpose of the production.....and shall not result in the degradation or pollution of the associated groundwater*. It also goes on to say that *if it is determined by the Administrator that a return to the*

background quality cannot be achieved, the affected groundwater will, at a minimum, be returned to a condition and quality consistent with the pre-discharge use suitability of the water.

What I will tell you probably in practical application is that this change means if you remove the treatability requirements for radium and most all of these aquifers in the mineralized zone where they produce the radium for the uranium, will be a Class IV aquifer, meaning industrial use. So your restoration requirements essentially will be that you restore it using Best Available Technology (BAT) to achieve the best you can and you also have to protect the adjacent aquifers which many times may be a Class I water....a high quality next to the mineralized zone.

That would be the background I could give. That's a real fast and probably complex discussion of it. Rick, do you have something you would add?

RICK CHANCELLOR, LQD: Not at this time. Maybe it would be appropriate to take comments from industry and the public.

BOARD MEMBER GINGERY: Mr. Loomis, I noticed you signed the Wyoming Mining Association's letter of November 8th. Would you like to go over that piece of correspondence so that we have a better understanding of what you have presented within it?

MARION LOOMIS, WMA: Mr. Chairman, what we did was redo the policy with the changes in a strike and underline format.

We'd like to see a little language added in there to clarify what the production zone is. We were little confused about whether the area included just the ore zone or went out to the area between the monitor well and the ore zone. The area within the monitoring wells would all be part of the production zone. We wanted to make sure that that is what was actually being regulated. It would not include the monitor well but everything from the monitor well through the ore zone would be part of the production zone and would come under this classification for Class V. We have three areas of question. That was the first one.

The second one was the definition of Best Practical Technology (BAT). There was specific legislation put in the statutes in 1978 that regulated solution mining for uranium and it was very specific. It's been in the statutes for years and it really applies to no other industry except in situ. It has a definition of Best Practical Technology and it has a definition that we've continued to rely on which is groundwater restoration. It says, groundwater restoration means the condition achieved when the quality of all groundwater affected by the injection of recovery fluids is returned to a quality of use equal to or better than and consistent with the uses for which the water was suitable prior to the operation by employing the Best Practical Technology. We've taken exception to the department's interpretation on this suitability thing for many years. We think that this language that's in here is appropriate and complies and ties into the statute. Once again, that's the only place that that definition actually falls in the statute.

BOARD MEMBER GAMPETRO: If the quality under the old guidelines was Class I water and it could be purified with a water softener, are you saying that your definition of returning it to class of use would be good enough if it returned it to the old definition which was what it was at the time that you tested the water prior to the mining? Or are you saying that you would return it to what is now a Class I or assuming it was Class I use? Do you understand the question?

MARION LOOMIS, WMA: If you had an ore zone there, there is no way that that water would ever be anything but Class V because it's got radium in the water. It would never be of suitable use for drinking water.

BOARD MEMBER GAMPETRO: Okay. Well, then what's the difference between class of use and BAT?

MARION LOOMIS, WMA: When they came out with the regulations they said you had to use the suitability or treatability in order to determine the classification. When you did that you might end up with something other than Class V but if you look at the class of use it would never be suitable for drinking water.

BOARD MEMBER GAMPETRO: Could it get to Class III?

MARION LOOMIS, WMA: No. Not in a natural condition. You'd have to treat it to get to anything above it. I can't imagine an ore zone that would be Class I or II. I suppose it's possible. If it was, then certainly that's what you'd have to go to when it was going back. I can't imagine the ores being there, the mineral being there, and having that high a classification.

BOARD MEMBER GAMPETRO: So what you're saying is you don't wanna have to turn what was always classified water into Class II water?

MARION LOOMIS, WMA: Right. We could but the way the regulations were written that was what we had to try to do even though we recognized that we could never get back to that because the natural uranium is still going to be there and still have radium in the water.

BOARD MEMBER GAMPETRO: Understood. You pump it back into the ground it's Class II, it turns into Class V.

MARION LOOMIS, WMA: Right. The Best Practical Technology (BPT) was the second point and we were concerned that the operator would be required to.....every operator would be required to do the same thing and what is the BPT for one operation and one aquifer might not be the BPT for another one with different aquifer or different geological conditions. Each of the mining permits have conditions and stipulations as to what's going to be the BPT for their operation. We would like to keep BPT as a site specific and based on your permit.

The last point was the use of a transport modeling. You may achieve a restoration very quickly that takes you back to quality of use. If you achieve that very quickly and can show that you achieved it, then we see no reason why you should have to do extensive modeling to show that. It's expensive and time consuming. The time when you would use modeling is if you can't get back to that low baseline and then you would use modeling to show what it'll be over a time period that will return it to a condition which would be consistent with the quality of use.

BOARD MEMBER GEORGE: So, your point Marion, is that if you've already achieved the class of use and modeling, at that point, it is futile in a sense or not necessary.

MARION LOOMIS, WMA: Right.

BOARD MEMBER GEORGE: That's just a clarification so that it's not a requirement that you always have to model.

MARION LOOMIS, WMA: Right. We suggested that in order to do that, that you use some of the language that's out of the Voluntary Remediation portion of the rules and the statutes in order to accomplish that.

Mr. Chairman, those are my comments and Donna, Steve, or Paul can elaborate on something I may have missed.

Yes ma'am?

BOARD MEMBER CAHN: Can I get clarification on something? You mentioned having the monitoring wells as part of the production zone?

MARION LOOMIS, WMA: No, the monitoring wells would not be part of the production zone but everything from that through the ore zone would be part of the production zone.

BOARD MEMBER CAHN: So the monitoring wells would need to meet the requirements for the class of use?

MARION LOOMIS, WMA: They would go to background.

DONNA WICHERS, COGEMA MINING: The monitor wells as Gary described may be Class 1 drinking water so we would be required to return the groundwater at that monitor well to it's classification.

BOARD MEMBER CAHN: But what you're saying is from that point towards the production.... not including the monitoring well.

MARION LOOMIS, WMA: Right. The concern I think is that the production zone would only be the ore zone and there would be no room between that and the monitor well. We want to make sure that production zone has to include some area between your ore zone and the monitoring well.

?: I think all we're saying here is here's the well field here and here's the monitor ring and we're just saying all this area inside is the production zone but this monitor ring defines the other water. So if the monitoring wells are Class 1 then stay Class 1 and everything inside there would be Class 5. It's just forming the boundary.

BOARD MEMBER PROFFITT: Then I have a question on page 6 of the memorandum that we received....

BOARD MEMBER PROFFITT: I'm only going to refer to one word and maybe you can reference it up on the map you just showed. It uses the term "influence" of the production wells. Now will the monitor wells be the outside....I mean that line that is shown there around the monitor wells, will that be the outside limits of the influence of the production wells?

MARION LOOMIS, WMA: It would have to be someplace between here and here. It couldn't get to here. If it got to there then you're affecting the area in the monitoring well and you'd have to clean that up.

BOARD MEMBER PROFFITT: My concern was that the influence would go beyond that but you're saying that under no conditions the influence would go beyond the monitor wells.

MARION LOOMIS, WMA: Right. If it did that would be called an excursion and we would have to clean that back up so that anything that we would impact would be presumably back here but since this is going to be a production well or an injection well, the injection well is going to come out. You will have some influence in this area. And this is a maximum of 500 feet. We're not talking miles.

RICK CHANCELLOR, LQD: One point of clarification....the monitor well rings can be considered like a point of compliance that ideally the impact from the production wells, injection wells, will not be that far out. That is the point of compliance that we measure to determine if they have an excursion. When they have the injection wells and they inject into the aquifer, there is a flare factor that goes out beyond that last well. So, there's some measure of feet. It's been discussed how many feet that is. It goes back to the mining efficiency that that well is in good balance and that the flare factor is not real large. If things go wrong, then it goes way out to the monitor well rings and you have an excursion. The question is, where does that line get drawn as far as this Class V designation? It's clear that the monitor well ring is not included and that's the main point because that is the point of compliance. Ideally the mines don't want their stuff to go out that far either because that's more water to clean up.

PAIGE SMITH, LQD: I have a practical question and I'm not a hydrologist but it almost sounds like you have to have another inner ring to detect any excursion before it got to the monitoring well because you're relying on the monitor well to be your total canary. It almost seems like you'd have to have another ring between the production zone and your monitor well because you don't want it to get to your monitor well.

MARION LOOMIS, WMA: That's the point. We don't want to have another ring in there. The monitor well would be the point at which compliance is determined. So if you're clean at the monitor well then you've achieved restoration. Your production zone is inside the monitor well through your well field.

PAIGE SMITH, LQD: What would happen if your monitor well is showing some elevated level that you don't want to have? What do you do then?

MARION LOOMIS, WMA: You would have to restore it and clean up until it did not show an impact at that monitor well.

PAIGE SMITH, LQD: Would you assume a 500 foot contamination between the production zone and the monitor well then?

MARION LOOMIS, WMA: You don't assume any contamination. You assume that at some point you're going to be a Class V inside of that area but you don't know exactly where that's going to be because you're not going to punch wells every 50 feet from the production zone.

BOARD MEMBER GINGERY: It says 500 feet typically but between the overlay monitor wells and the production zone, is there a name for this area between here and here?

PAUL GORENSON, RIO ALGOM: I guess you would call it a buffer area but we've never called it anything. I think what we need to make sure we understand is that this is highly idealized and 500 feet is between the nearest injection well to the nearest monitor well. That's the maximum distance they can have between each other. This area here, if you look at it on a restoration basis, if you get an excursion out here you have to take some action, it's required. It's in your permit and I believe it's required in the regulations. You have to have some immediate action even during operations. This isn't during restoration. At any time that occurs you will take action immediately. That action can be either increasing your pumping rate to remove more water out to draw...whatever plumes out the back end. You have to make some immediate change in your operations and it's not an option. You have to do something to correct that excursion. If you have the monitor wells too close, you'll have a lot of false positives because you get too close to the influence of the well field. You're dealing with dynamic systems in here. During restoration, any elevated constituents that would be outside the exact pattern area would be cleaned up as part of the restoration. The same mechanism that got them out there to the operations of the pattern, the sweeps or the flares, as Rick mentioned, those would also be part of the restoration effort too because you would be sweeping the clean water as well to those areas. Any impacts you have outside the pattern area within the production zone would be part of the clean-up process.

BOARD MEMBER SKINNER: I'm like Paige.....what you're really asking is that you've got a basic technology and you would like to have a buffer zone within that mining of 500 feet based on your technology to manipulate back and forth not only the mining but the clean-up but anything out of that buffer strip of 500 feet, that's the type 1 or good water, inside that based on your technology you've got a little freedom because it's under ground to work with but you've got a definite boundary. Is that right?

MARION LOOMIS, WMA: Remember, we would be restoring everything to quality of use inside of that area....production zone.

BOARD MEMBER SKINNER: Within that buffer zone, it's Class V, outside it's Class 1 or whatever.

PAUL GORENSON, RIO ALGOM: Some of these may be Class IV. Also, we sample all these wells in here to establish what our background concentrations are so I guess it's a guideline. A lot of times there'll be ore out here that's not economic. This is an economic process. It's an economic recovery of minerals. You'll have uneven proportions of ore outside of it that would still be Class V but it's not part of the pattern area so that mineralization would also influence ground water quality whether we're mining or not.

BOARD MEMBER GINGERY: Any other questions? Production zone monitoring wells says it's a zone but actually it's just a boundary line between the blue and red here. That is not part of the zone is it?

MARION LOOMIS, WMA: It's not part of the ore zone but it would be part of the production zone as defined here.

BOARD MEMBER GINGERY: Okay.

MARION LOOMIS, WMA: That would all be the production zone but it would not include the monitor well.

ROBERTA HOY, LQD: I might back up in terms of the monitor wells and the classification process

which might help because we sort of started in the middle instead of at the beginning. Paul touched on the beginning but if I can borrow your drawing, I'll point some things out.

There's actually four sets of monitor wells in an in situ well field. You have what's called a monitor well ring which is all these out here. You'll have monitoring wells within these pattern areas and then you have monitor wells in the overlying aquifer and the underlying aquifer. So you really have four different sets and we need to be sure we're all talking about the same set.

When a well field is first thought of, all these wells are installed and you start taking what's called baseline sampling and then the classification process starts from baseline sampling. Where they think all their injection and production wells are, the water quality of these wells is averaged and you come up with a classification - Class I through IV. Class V doesn't come in until later but then out here you go well by well. Individual wells are not averaged. It may be a Class I, Class I, Class I and then you'll have a Class III and then you'll have a Class I but this is averaged. You may want this area exempt and that's where the Class V comes in. In order to get an EPA aquifer exemption, you need to be able to have a Class V which is the mineral commercial. The way the production zone was defined, you look at the actual pattern area of each injection well and each production well, and look at how much the flare factor is around it. In other words, you don't want to make this too huge or you'll wind up with an excursion. You want to make it fairly efficient because you don't want to use a bunch of exiviant, the injection fluid that helps dissolve this stuff. It's just a balancing of the injection and the production. That's how we've always sort of looked at production zone - it doesn't go all the way out here. It looks at mining efficiency in terms of where it is between the two. Hopefully that helps clarify some things.

BOARD MEMBER CAHN: What about the overlying and underlying aquifers? How are those assessed for water quality? Well by well or averaged?

ROBERTA HOY, LQD: They're well by well.

BOARD MEMBER CAHN: It seems to me that we need to be very specific when we're talking about monitoring wells like if there's three or four different types.

MARION LOOMIS, WMA: Mr. Chairman, in all cases the monitor wells are going to have to be background, right Donna?

DONNA WICHERS, COGEMA MINING: Class of use. Mr. Chairman, I'm Donna Wichers with COGEMA Mining and I just wanted to add a point to Roberta's statement. She mentioned that EPA classifies the well field, exempts the aquifer and that's very true. One thing that you have to remember though is that EPA exempts the aquifer out to the monitor well ring which is what we are asking for. We feel that the monitor wells are not part of the production zone but the area between the pattern area and the monitor wells is. That will be consistent with the EPA aquifer exemption. If we go with just the pattern area, that will be inconsistent with what EPA has already granted these operations. That's why we say in our language that it is consistent with EPA's aquifer exemption process. When they classify the water is Class V.

BOARD MEMBER GEORGE: I have had conversations with the Mining Association and the operators as an industry representative. I think they're not asking for any major changes. They're asking for clarification of some language because the way the current memo was written that zone between the

ring of monitor wells within the aquifer that we're extracting the ore and the ore production. That area in there is kind of a no-mans land or undefined as where it is. Since it is granted the exemption by EPA it would seem only logical to include it in the production zone. It doesn't change what they're doing. It doesn't change their requirements for clean-up or restoration. It just simply tells you that this is what we're dealing with.

BOARD MEMBER GINGERY: Before we move on, are there any other comments from other board members? Yes, Jim?

BOARD MEMBER GAMPETRO: This is a different part of the response here….but the use of the groundwater fate and transport modeling.....I'm not familiar enough with the modeling process. Is there any danger that if you obtain the quick results that that could change later or will the monitoring continue to ensure that that does not change later?

MARION LOOMIS, WMA: You have a curve that comes down and there's gonna have to be discussion with the department when you have reached the point that it's going this way. I would assume that's going to have to be negotiated site specifically for each mine. I think that's what we're proposing is if you have something in your permit that is particular to your aquifer, your mine, and what you agreed to do in your permit, that ought to be what controls that. Not applying the same modeling to every operation and having a cookie cutter type of requirement. Donna is that accurate?

DONNA WICHERS, COGEMA MINING: Yeah, I think so. The department mentions in here some monitoring to verify the model and we've not suggested any changes to that.

PAUL GORENSON, RIO ALGOM: I just want to clarify one thing. You're talking about quick results. I assume you meant for restoration? We do have to do a stability monitoring period where you monitor after restoration was deemed complete, everything was stable. All pumps are shut off when you monitor for 9 months a year or however long it takes for there to be a demonstration of stability.

BOARD MEMBER GAMPETRO: That was my question.

PAUL GORENSON, RIO ALGOM: That's determined in your permitting process prior to the starting of operations. You set that time as part of being a minimum there. As Donna clarified, if we get to a point where we're going to be using fate and transport modeling for some other reason to determine whether it's going to be an impact with the production zone solutions to the groundwater outside of the production zone then whether there's any monitoring or not to demonstrate, that's something that's done on a site specific basis.

RICK CHANCELLOR, LQD: One concern I had about the use of fate and transport modeling is the language proposed by the WMA talks about either the background or the class of use. I think they have the argument if they achieve background even though the groundwater chemistry is probably different at least it's more to the parameters of what was there before. If you go to class of use, you may have some parameters that were real low pre-mine and now are real high but still meets class of use and those parameters are the ones that we're concerned about maybe migrating off-site. I'm concerned about saying if you meet class of use there's no modeling ever required because we may have concerns of some of those constituents that are a lot higher than background that has potential to migrate off-site and impact class of waters outside the production zone. That's my concern with their proposed language.

DONNA WICHERS, COGEMA MINING: Rick, when I first read our own language I sort of thought the same thing but what we're saying here is if we restore to background, we don't do the modeling. If we restore the well field to the class of use of the monitor well, we don't do fate and transport modeling. If after the application of BPT groundwater within the production zone cannot be returned to background or to the class of use of the groundwater outside the production zone, then we don't necessarily have to do the modeling. If for some reason we have Class III as the monitor well use, if we restore that well field to Class III, that's what we're saying, that it shouldn't get any worse at the monitor well.

RICK CHANCELLOR, LQD: If you have some case where some of the monitor wells are Class I and Class III, how do you propose that would work out?

PAUL GORENSON, RIO ALGOM: I think you probably want to work that out as a site-specific thing because all your monitoring wells are site specific. At Smith Ranch, our monitor wells are classified. We have varying classifications for our monitor wells which are around it. I think that'd be something we'd have to work out with the agency at that time. When you state you're done with restoration, you've gone on the stability as part of the restoration completion report and it gets approved, there would have to be some consideration for that or for the action.

BOARD MEMBER LABONDE: I guess I'm struggling with this language because what you're proposing is that *if after application of BPT groundwater within the production zone cannot be returned to background*. Then it goes on *or class of use of groundwater outside of the production zone*. My question is if you go one paragraph above in the middle which says *the standard is the restoration to premining class of use*. If that's our standard to put it back to the previous background or class of use, why are we talking about a *"if" the application of BPT groundwater within the production zone cannot be returned*. I question whether that's even acceptable to even consider that.

RICK CHANCELLOR, LQD: The statute on in situ restoration has two standards if you want to call it that. The first effort is to achieve background. The second one using BPT to achieve class of use. The initial goal is that you plan to restore to background. If you can't do that then the cealing may say is class of use. So there's two standards or a goal and a standard...how ever you want to look at it but there are two items there.

BOARD MEMBER LABONDE: Okay, I understand the background. If we can't return to background we're going to class of use but this reads or the class of use of the groundwater outside the production zone. That would seem to infer that the only time that modeling would be applied.....well we could look at a situation where we're not even going to meet the class of use in the production zone. To me that's the standard as you related it that we have to achieve one of those two.

RICK CHANCELLOR, LQD: I think it could be clarified there because clearly it is the class of use when the production zone is the requirement. I believe what they're trying to say is that for the monitoring question, this language only applies to whether or not you do monitoring and does not impact the actual restoration.

BOARD MEMBER CAHN: You mean the modeling?

RICK CHANCELLOR, LQD: The modeling, excuse me, yes. So it could be clarified there.

BOARD MEMBER GINGERY: Gary and Rick, in the present operations that we have, have we had to go out past the production zone monitoring wells? Have we had incidents that we found that we had to go beyond that in the present operations?

RICK CHANCELLOR, LQD: There have been excursions at some operations where the monitor well did show that the injection fluid had migrated out that far. They're required to take corrective action to pull that water back in and clean up the water in that area. We have not, to my knowledge, required an additional well outside the monitor well ring. Although, that would be a possibility if they could not clean up that water. We feel we have that right to say, "Let's find out how far this water has gone."

BOARD MEMBER GINGERY: Harry, did that answer your question?

BOARD MEMBER LABONDE: Yes.

BOARD MEMBER GINGERY: So, your office could call for a well beyond the known production zone wells?

RICK CHANCELLOR, LQD: I think if they failed to control the excursion of the monitor well ring. I think we have the power to require additional wells to track where that water has gone and what's going on there.

BOARD MEMBER GINGERY: Does the Association...do you have that same.....

MARION LOOMIS, WMA: Mr. Chairman, the Administrator has tremendous authority to do whatever he wants to do and as long as you're producing they can require all kinds of things and what we're talking about in this is restoration. Certainly during production, if there's an excursion out there they're gonna have to do whatever it takes to get that handled but that's gonna happen as they're producing. What we're looking at here is really restoration - what you make sure that it's back to. I take some exception to Rick saying that the statutes say that you first restore to background. The statute as I read for in situ, says that you return to use. Now the rules and regulations that were adopted had that two-prong comment that Rick talked about but the statute says quality of use for in situ only.

BOARD MEMBER GINGERY: Thank you Mr. Loomis. Unless there's some questions from the board maybe we should open it up more to the public. I think the gentleman in the back had his hand up.

ROB BONER, LANDOWNER: I'm a landowner in the PRI operational area. I have a couple questions for Mr. Loomis for clarification.

Your expansion of the production zone, is that to include the monitor ring? Would that be strictly in the horizontal surface? You wouldn't include the monitor wells above and below the production zone, would you, for the ore body?

MARION LOOMIS, WMA: We have a representative from PRI here that could answer better than I can but it's my understanding that in no case can your monitor wells be impacted. You're going to have to restore to background at the monitor wells. Vertically, horizonally you're going to have to be back at that point. Donna or Steve do you want to elaborate on that?

PAUL GORENSON, RIO ALGOM: The monitor wells are what's known as the background, I guess. The same thing with the overlying and underlying aquifers. They are not part of the exempted aquifer. Monitor wells, the production zone which is this horizontal zone where we're mining, those represent the outward boundary of the aquifer exemption...the exempted aquifer. There is no exempted aquifer in the overlying and underlying so we're not proposing to expand the production zone to incorporate overlying or underlying aquifers at all. Those are not part of the scope of the exempted aquifers.

ROB BONER, LANDOWNER: That's what I was trying to get a definition of - the expansion of the production zone but the Mining Associations proposal is to include up to the monitor wells, correct, and not vertically?

PAUL GORENSON, RIO ALGOM: I don't think we're proposing to expand anything. I think we want to make sure it's understood in the language when you talk about production zone, what production zone means because there's definitions that we're dealing with. Production zone as we, the agency and us, understand it, is the exempted aquifer. Am I right on that Gary? Is that pretty close to what our understanding is? The exempted aquifer and the production zone are one in the same?

GARY BEACH, WQD: Can you state the question again?

PAUL GORENSON, RIO ALGOM: The question that was asked by Rob Boner was whether we were proposing to expand the production zone to the monitor wells and my response was that we're not proposing to expand anything. We're just trying to make sure that the description of the production zone is consistent with the description of an exempted aquifer.

GARY BEACH, WQD: That's my understanding is when they exempt it they exempt the mineralized part of the zone which obviously goes out to whatever you're monitoring wells are.

ROB BONER, LANDOWNER: Therefore, that would not include aquifers above and below the ore body?

PAUL GORENSON, RIO ALGOM: That's correct.

ROB BONER, LANDOWNER: Thank you. My other question is that the Mining Association's proposal is to change terminology to use BPT to take into account economic reasonableness. My question would be who defines what's economical reasonable?

MARION LOOMIS, WMA: There is a whole long discussion on economic reasonableness but it's an interpretation of when you reach a point where spending millions of dollars more only gets you that much, whereas you're already down this much. So there's this curve that comes down and it doesn't make any sense to spend millions of dollars when any advantage or cleaner water is going to be very questionable. That's a determination that has to be negotiated with the department and they say yeah, it doesn't make any sense to continue to pour money into this because it's not going to improve anything. Understanding that you still have to get back to the quality of use, you're not going to be degrading it. It's not going to be left to something you can't use. If you're using it for livestock water now, it has to be suitable for livestock water when you're done.

ROB BONER, LANDOWNER: In summary, that would be an on-going dialogue between industry and DEQ.

MARION LOOMIS, WMA: That's my understanding.

DONNA WICHERS, COGEMA MINING: One other thing Marion, economics is discussed in the statutes.

MARION LOOMIS, WMA: Right.

BOARD MEMBER GINGERY: I hope that answered your questions Mr. Boner. Rick and Gary, is there a point of almost non-return no matter what you put into it? Do you want to comment on that Rick?

RICK CHANCELLOR, LQD: I think in our policy statement we talked about that concept where you do your restoration activities and the parameters drop down toward background and at some point it starts leveling off and you're not getting much return on your efforts. Some point in that curve it starts to flatten out and it's undefined where it is that the operator and us would sit down and they may say they achieved the results necessary, here's our graphs showing restoration efforts, we'd review it and see if we feel that any more is required but someplace in there where it starts to flatten out like they said is our thought also.

BOARD MEMBER GINGERY: Board members, does anyone want to comment on that concept or that part of it? Yes, Rob, you have another question?

ROB BONER, LANDOWNER: Maybe more of a comment asking for a response. The third suggested change about the fate modeling. The last paragraph of the suggested change is a remedy shall be considered to be protective of human health. Since my knowledge or experience is that these operations are located a long distance from population centers, from my perspective, I would like some consideration given to the pre-existing and subsequent activities, basically livestock production and also take into account the continuing ongoing use of the land.

BOARD MEMBER GINGERY: This is after production or while production is going on?

ROB BONER, LANDOWNER: The way I understand that paragraph is we do a risk assessment on what's left there and my concern is that if the only parameter that goes into that risk assessment is how it affects human health, I would have a concern there. I think maybe it should also include what the subsequent use of the land is.

BOARD MEMBER GINGERY: Rick, have we looked into the agricultural aspect of the quality of.....

RICK CHANCELLOR, LQD: We feel by returning it back to the class of use at the monitor well ring, if you look at fate and transport to make sure that that class of use is not impacted, if agricultural activities was the use before mining, then our goal is to also protect it after mining. That's why we want the fate and transport to make sure that nothing is going to leave the site and impact those waters off. That is our goal.

BOARD MEMBER GINGERY: Some of the members of both boards represent agriculture. Do you have a comment on that?

BOARD MEMBER MUNN: The reclamation at the uranium mine goes back quite a few years to earlier technologies and this certainly disturbs a lot less of the landscape and presents much less difficulty in terms of managing the surface afterwards in terms of the relative disturbance. I think in general, I'm not sure what the economics are that drive the system, but this is certainly easier to deal with than the pits and the mounds of tailings and all the things that went on 25 and 30 years ago.

MARK MOXLEY, LQD: Mr. Chairman, I'd like to raise a question and it relates mostly to this concept of the size of the ore zone or the production zone extending to the monitor well ring. One thing we are charged with is bonding for reclamation and restoration of groundwater. Something we've struggled with over the years is what is the flare factor? How far out from your well field is the groundwater influenced by this operation? So how much bond do we have to hold for restoration of the groundwater? If you draw the line all the way out to the monitor well rings that almost means that we have to bond for restoration of all that groundwater within that ring. I know that's not what's happening but if you define that whole area as the production zone, you're saying that potentially that whole area could be impacted by the operation and therefore we have to bond for restoration of it. I'd be interested in industries perspective on that question and how do we address it.

DONNA WICHERS, COGEMA MINING: Again, what we're talking about is already established. We're talking about operational things right now. When we calculate our bond and our restoration program, each permit is individual. We all do it a little bit differently because the hydrology of our production zone is different. So we calculate what our flare factor should be and our bonds are based on the calculated flare factor that Mark is talking about. So that's already established. What we're talking about today has nothing to do with that process. We're just trying to clarify where the class of use changes for the restoration standard at that well. The bonding as I see it, we're not affecting anything because we've already established that.

GARY BEACH, WQD: I understand that these are the monitoring wells and this is your production zone. Somewhere between here is the flare or whatever you want to call it. We all understand that from this point out they have to protect the groundwater and they conduct their operations in here. There are no wells in the middle of here that tell you anything different. The production zone begins from right here at the edge of this line in or the production zone is here because you're not going to know where it is in between. I don't see where this proposal talks about referencing EPA's exempt aquifer really changes what historically has been done unless we want to in concept start trying to imagine some kind of change. I just don't see that.

RICK CHANCELLOR, LQD: In a surface mine they show on their maps all the land that is going to be affected but they may not affect all that land and we generally go with what they affected and what they plan to affect that given year and we don't bond for the whole permit area. I guess you could say the flare factor that we settle upon is what the limit of impact is expected by this operation. If there's an excursion, we can expand that area of impact to include bonding for cleaning up that excursion. I think we have the right to do so. So when I question the bonding I think that we would still follow this current mine step that the flare factor determines the disturbance boundary if you want to call it that or impact boundary. I don't see that we need a change there. I'm comfortable with that.

BOARD MEMBER GINGERY: I guess the bottom line between the Administrators of these divisions and the industry is we clarified this and I'm taking that there isn't that much difference between your two

statements. It's more of an academic definition but overall it's the same. Are there other questions from the public? Yes?

JILL MORRISON, POWDER RIVER BASIN RESOURCE COUNCIL: Mr. Chairman and members of the board, thank you for the opportunity to provide some comments. We haven't had much time to review this proposal which we received at the end of October and most of you just got copies of the Mining Association's proposal. We do have members and agricultural producers in the areas where there is uranium mining and so we have a lot of questions and would like more time for the public and those people potentially effected to have an opportunity to review the proposal in more detail and ask more questions.

One of the primary questions is that we understand that this will make it much simpler for the industry and save them some money. Our concern is for current and future drinking water supplies in that area because most people are entirely dependent upon the groundwater both for livestock and domestic water supplies. One of the questions we had when we were looking at this proposal is how many of these areas actually meet the Class I requirements? If it's determined as Class I, are we going to change it to a Class V industrial use when it was being used as a Class I use? Again, I think there's some questions just looking at the Mining Association's proposal on this statement that it's important that the entire area within the monitor well ring be included as part of the exempted aquifer and described as the production zone. Again, a question of how many domestic and livestock wells are in that area that are in use? Would they then be dropped to an industrial classified use?

I think we have more questions than that but I haven't had much opportunity to visit with people about their concerns and would ask that the board would provide the public with some more time for review. Thank you.

BOARD MEMBER GINGERY: Thank you. Any of the board members have questions? Any other public questions? Yes, Lorie?

BOARD MEMBER CAHN: I also have some concerns about this language on using risk assessments because I don't think it addresses what this woman was saying in terms of future or hypothetical future uses. I have some concerns about the language. It raises a lot of questions in my mind as to how do we address something that's not currently domestic use but is a hypothetical future domestic use to the quality of water?

BOARD MEMBER GAMPETRO: Could somebody maybe respond to the two questions that she did ask? Are there any domestic wells in an ore field?

DONNA WICHERS, COGEMA MINING: With the concept of taking out the radium treatability, all of these ore bodies are going to be Class V. There will be no Class I ore bodies. All of these ore bodies have radiums over the drinking water standard.

BOARD MEMBER GEORGE: Naturally?

DONNA WICHERS, COGEMA MINING: Naturally, yes, at pre-mining baseline conditions. This is a uranium ore body and there is, sometimes in many cases, other metals and total dissolved solids that make it not Class I either.

In response to the question about are there wells between the well field and.....no. People do not have wells that they're using within our mining operation. In fact, EPA has a requirement when they exempt an aquifer, you cannot have someone using the water within this exempted area. It just doesn't happen.

BOARD MEMBER MUNN: Can I ask for a clarification on what I think is important? Say there was a Class III aquifer above your ore body aquifer you're not going to be affecting and this change would not affect that. You can't affect that. It has to stay Class III or whatever and your mining operation can't change that so one hundred years from now somebody could come in and put a well in that layer for stock water if that's even an appropriate thing.

DONNA WICHERS, COGEMA MINING: Sure, as soon as we reach bond release and our mining permit is through with, then yes, they can come in and do.....(voice fades).

BOARD MEMBER CAHN: I guess I'm still stuck and need clarification from the mining industry on the use of the risk based assessments to demonstrate protection of groundwater outside the production zone. You brought it back to the production zone and I clearly understand water quality within the production zone but you're bringing it in outside the production zone so I need clarification as to why you want to look at risk based as opposed to meeting standards outside the production zone. Especially when receptors are not necessarily human receptors but can be livestock. So why is the use of an alternative approach important to the mining industry?

GARY BEACH, WQD: I obviously didn't recommend this but I can try to respond to it and then if I'm incorrect I'm sure the Association will correct me.

I think the reference here is what's called the Voluntary Remediation Program which is a relatively new program in Wyoming that was created in the Environmental Quality Act so they have sited the Act. Essentially what that program now allows is if you have a contaminated area and you are unable to clean it up with current technology, you can seek eligibility under this program which allows you to restrict access to that contaminated area and use long-term remediation or wait until the technology is available to reclaim it or remediate it. Essentially I think what their reference here is to acknowledge that they may be eligible for that program. If, for example, you have contamination outside the production zone and the technology is not there to restore it to class of use, that's what you have to restore to for the outside area outside the production area. If you cannot achieve that you might be eligible to come in under that Voluntary Remediation Program and get certain waivers on restoration but in doing so you're going to have to restrict access then to that land and water. You'd have to set up institutional controls so that you would in fact then be protecting public health, safety, wildlife or whatever the receptors may be.

I would suggest one change to their suggestion here. They say *shall be specifically be allowed*. There are eligibility requirements in that Act and I think we should say *may be allowed* because there may be some restrictions where they were not eligible for that program.

BOARD MEMBER GAMPETRO: Can I ask something about that? If that happens, what happens to the landowner that doesn't have mineral rights and is trying to use that land? Is he compensated in any way?

GARY BEACH, WQD: That might be something that the operator has to work out with the landowner under this program to restrict certain access if his use of the land could threaten public health and safety or livestock. If they want to make themselves available to this program they would have to work out the restrictions in that case through probably some kind of compensation whereby those receptors were not accessible to that land or water. The burden would be on the operator in that case.

BOARD MEMBER GAMPETRO: Oh, on those lines on the Class III water...is that a much lower standard than the Class I? I mean, if the stock were drinking it and then we're eating the beef...what is that by the way? Is there a big difference of ppm or whatever?

GARY BEACH, WQD: Through your risk assessment you would look at the bio-accumulation. In other words are they going to consume something that would be accumulated in the meat of the animals that we consume? If that were the case, then you would want to restrict the access of those animals to that water.

BOARD MEMBER GAMPETRO: I guess I'm asking what's the standard? The gentlemen behind you seems to know.

?: Class II and Class III are 5 picoCuries per liter just like Class I.

BOARD MEMBER GAMPETRO: That's exactly what I was asking. Thank you.

RICK CHANCELLOR, LQD: Just a point of clarification about an earlier question. If there is an existing water well in the area and WQ went to classify it as a groundwater, use of that water plays a big part in that classification. Even though the constituents are really Class II, if somebody's using that water for drinking water then it becomes a Class I so if there's a pre-existing use of the water that comes into our classification system.

STEVE JONES, PRBRC ATTORNEY: I represent the Outdoor Council. For those of you that don't know me, I was a former Assistant Attorney General for the State of Wyoming and I worked with the Department of Environmental Quality and had to deal with a lot of these groundwater issues back in the 1980's.

I guess the first thing I'd like to note is that it seems like we have two proposals before these two boards. We have the DEQ proposal and then the WMA's proposal. I think there is enough substantial difference between the two that I would suggest that this body maybe defer acting today on either one of them and send them both out to public comment again and then after the public has had a chance to look at the WMA's draft, this body could accept comments on that then these two joint boards go ahead and make a decision at that time as to what policy they might want to approve because at this point the public really hasn't really had a good opportunity to review the Wyoming Mining Association proposal at all. I don't think it was made part of the public announcement and I think there were just a few extra copies of these to hand out. That would be my first suggestion.

With regard to what Gary Beach was addressing, looking at Section 5 of Chapter 8 of the Water Quality rules and regulations, you'll note that he was talking about Class I water of the state and it says *it shall be classified by ambient water quality and the technical practicability and economic reasonableness*

of treating ambient water quality to meet use suitability standards. I have to admit, I really didn't understand what he was talking about in this proposal until I heard him address the board today. He's basically saying either one of two things: One, we're going to ignore this Section 5(a) and not regard *technical practicability and economic reasonableness of treating ambient water quality* because I guess up until now it has been quite economically feasible to treat radium. Secondly, he could be saying that now all of a sudden it's no longer technically feasible and practicable to treat radium anymore. At least that's what I'm hearing him say.

Since radium is the primary constituent of concern, I guess that's what Donna Wichers is saying, radium is the big problem here and it would all be Class V because of radium that they're just going to ignore this. Now, what I don't understand and I haven't seen this in any of the public announcements on this, is there anything where the EPA is now saying, "Well, yeah, it's too dangerous to treat radium? That's a hazardous activity now?" Did the Nuclear Regulatory Commission come in and say, "Oh, we don't want to be doing that any more, we're figuring out that that's not a safe thing to do?" I'm not getting the sense that that's what's going on and I didn't see any economic data as part of the public announcement on this. Now all of a sudden radium is not treatable. It seems to me it's still treatable and that still ought to be an option for people to utilize if they want. If they want to take that groundwater and use it as Class I, radium is a treatable thing and I think the industry ought to be required to bring it back to whatever the ambient water quality is. I guess according to this statement, it is still treatable and if there's something now about trying to handle the waster water, the filtrate, that's a little more dangerous, I think it can still be handled. I don't think this board has been presented with evidence that it's not anymore capable of being treated.

Looking at page 7 regarding Class V, Mineral Commercial, I think what people are saying there is basically the idea is to bring the water quality back to background if at all possible. That's the way I read Section 4(d)(viii)(B) on page 7. You have this mineral production area and a discharge into a Class V groundwater shall be for the purpose of mineral production and shall not result, in the degradation or pollution of the associated or other groundwater unless the affected groundwater quality can be returned to background or better quality after mining ceases by reduction or elimination of pollution. So the way I'm reading this is that DEQ gives the uranium companies sort of a free-zone and I would think that would be the ore zone, this area, where they actually have producing wells and then they establish a monitoring ring somewhere outside of that that has monitoring wells. Then if they notice excursions, as Mr. Chancellor said, they can be required to clean-up back to this production zone line while production is going on but after mining ceases the whole thing has got to be brought back to ambient water quality if at all possible or if that's not possible then back to a class of use. What's the class of use going to be if we don't do something about radium? If you look in the Chapter, 5 picoCuries is the standard for Class I, Class II, Class III, and Class IV, I believe. Now there's no standard for Class V. So basically, this is going to be a sacrifice zone if you go ahead with this policy. They're going to condemn this to a Class V permanently. They're not going to have to bring it back to background and if you don't go with 5 picoCuries per liter on radium, you're in Class V. I've looked at the regulation and I don't see any list of constituents for Class V so basically you're going to go from what this water was before which, let's say out here, it's Class I outside of this monitoring well ring to Class V. What's going to happen to this groundwater is it's going to keep on migrating unless they clean it up or unless they have a permanent restoration well system set up. I see a lot of problems with this policy that we're talking about here. It seems to me they ought to continue with what's in the regulations which is required that it be cleaned up. In other words, clean up the radium because it is treatable. If they have a problem with the filtrate or something they can haul that off and dispose of that properly. I have a lot of problems with the policy as DEQ is suggesting.

Now, to address, if I could, just a part of the Wyoming Mining Association proposal. It seems to me what they're saying here is that within this monitoring well ring you get down to one inch inside the monitoring well ring and if that's contaminated, that's okay. That's what the Mining Association wants. Basically expand this production zone out to the very edge of the monitoring well ring. They're saying they'll keep this at the monitoring well because they have to make it clean. That's good but to say any where in here is okay to have it dirty and industrial Class V and then one right at the monitoring well has to be clean, I think, is unrealistic. That's the point of having the sort of distance between the production zone and the monitoring well ring is if you note a problem at the ring and that's the only time you're going to note it, is you're only going to pick it up at these monitoring wells. DEQ can say you've got a problem and you've got to clean it back up to the production zone area. At that point they do start a clean-up and it's gotta be within the production wells and to me that makes sense that your early warning is maybe out here but their duty to clean up is back to the production zone otherwise you're condemning too much of an area. It's just not realistic to say, "Okay, you can do whatever you want clear out to one inch in front of these monitoring wells." What's going to happen is you'll have contamination that you're picking up at the monitor wells and then it will get beyond that. This will be my prediction, when you get down to individual cases, the companies going to say, "We don't have to worry about what's in here because we've got this policy that says anything inside the monitor wells is okay." They're not going to try to clean it up in here at all. I just want to make sure it doesn't get any further. So, by changing the policy in the way that the Wyoming Mining Association is suggesting, I think that you're widening your area of contamination.

BOARD MEMBER GEORGE: Do you understand the process by which the EPA exempts these aquifer zones?

STEVE JONES, PRBRC ATTORNEY: I have not looked at that very well Mr. Chairman but I know that Donna Wichers says it's inconsistent. I could address that if you want. DEQ is requiring that it be within just this inner production zone and that's where they have to keep it clean. There's nothing inconsistent with what EPA might be requiring if EPA requires a broader area, DEQ can still be more restrictive. To say that you have to go along with this because EPA is doing it is just not true. The State of Wyoming, DEQ, has the option of making this the requirement that they stay clean outside the production zone, and really, as a practicable matter, I think Gary Beach is correct...look there's no other monitoring wells in here so some contamination may get out and you're not going to know but at least when you get to these monitoring wells you can say that you have a problem and know that you have to clean it back up to here.

BOARD MEMBER GEORGE: That wasn't my point. My point was that they can only exempt it under certain conditions when those conditions don't allow it to be used for those other class purposes. We do this in oil and gas. We do this in all industries because of the content of that aquifer, it cannot be used. That's the only circumstances under which it can be exempted. If it were used for drinking water and could be continued to be used for drinking water it would be very difficult to gain that exemption to inject foreign or pollutant fluids into either an oil and gas well or any other kind of well. So, that's part of the concern here where you already have high radium levels in these reservoirs that naturally occur because the ore body there is generally where the exemption is granted. My concern is what is that area between that production zone and the monitor ring around them? What is that? We could put monitor wells every fifty feet out there but that becomes kind of an unnecessary or untangible situation to do so DEQ selected a 500 foot interval away and a 500 foot radius because they can determine sphere of influence on a monitor well by that distance and that's how they determine whether or not the outside aquifer has been affected by the

production zone. I don't see where this is a great change of anything. Their monitoring requirements aren't less. The constituent isn't changed that they have to achieve back to class of use. None of those things have changed at all. Their bonding requirements haven't changed. All of the things are still in place, it's just finely defining what that interval is. The fact that it was exempted by EPA because it was assumed that that area wasn't a usable area.

STEVE JONES, PRBRC ATTORNEY: Well, keep in mind Mr. Chairman, that we're only talking during the actual production. Once mining ceases, at least the way I read the regulations, it's to be brought back to ambient quality or equivalent to classification of use for that entire area. To address your question, I think DEQ's idea that this area here is sort of a buffer zone and there may be some contamination going on but we don't know about it because there's no monitoring wells. We'll only pick it up at this 500 foot distance. That's a good idea because then if you established that there's a problem, contamination is reaching this outer ring, what are you going to do? That's the practical question that has to be faced at this point, to my mind at least. To then say you've got to address that, you've got to start cleaning it up in this buffer zone and get it back to the production zone, that makes sense because otherwise industry is going to say, "Well, we don't have to clean it up in this buffer zone" so it ends up being a much wider area of condemnation, if you will...sacrifice zone. To me, only within the production area should really be a sacrifice zone and this buffer zone out here if there's a problem noted, and I think that's the intent, that area has to be cleaned up so that it just stays within the production zone. I agree with you in terms of practice that these wells stay clean under either theory, there isn't going to be any difference but the question is what's going to happen when you pick up some contamination. I think DEQ ought to be able to retain the power to say you need to get things cleaned up back to within the production zone. At that point I think that you do start maybe having to put some monitor wells within that ring to verify that you can clean it up or you're getting it cleaned up back to the production area.

BOARD MEMBER GEORGE: You already have monitor wells within the production zone and your use of the word sacrifice...they're returning it to premining conditions in which it wasn't usable because of the ore bodies present at that point. I think the use of *sacrifice zone* is kind of a cheap shot in a sense of using that kind of terminology.

STEVE JONES, PRBRC ATTORNEY: Mr. Chairman, I'll accept that as a friendly amendment.

BOARD MEMBER GAMPETRO: Rick, could you respond to his first comment about the change in the regulation? I'd like to hear your view point on it.

RICK CHANCELLOR, LQD: I'd probably be more appropriate for Gary to address that since it deals with his regulations but the idea or concept of treating radium is a policy to start with. It's not in the rules. It's not really a change in rule. I think it's a way of saying we looked at the waste issue and feel it's inappropriate to create that kind of waste and therefore it's inappropriate to apply the treatability rule. The treatability rule is still there but it's flexible on how the WQ division uses that on a case-by-case basis. Maybe Gary can fill in from there.

GARY BEACH, WQD: I would guess that 10-12 years ago, this may have been when Steve was still there and maybe that's why he's so concerned because we've changed the policy since he was there, but 10-12 years ago we had a policy where we felt that a simple water softner could remove the radium. I

think it's true, you can very easily with low salts remove the radium with a water softner.
I think today, when we started rethinking this, I asked one of our staff to contact the Culligan Man and talk to him about it. I think what we have discovered is two things: One that you're going to end up with a radioactive waste that you have to deal with. Let's face it, rural people, what are they going to do with this kind of waste when you live out in the middle of Wyoming, that's where the uranium deposits are at. They're not a municipality that's tapping this water and treating it but these are rural homes.

Secondly we also know that there is great emphasis now on radon gas in homes and it is delivered through water. So, if you're using this water, even if you've got a water softner, you're going to be getting radon gas coming into your home through the water. EPA now has some limits out on radon gas in water. It caused us to rethink if it is really an economically and reasonable policy for treating radium. That is our logic. We're backing away from that policy we had 12 years ago where we felt it was treatable up to 100 picoCuries per liter but we don't feel that's reasonable today.

BOARD MEMBER GAMPETRO: I guess that's where I'm confused. I guess when I first read this and listening to you now, I felt that it was actually an improvement in the protection for the public to change the policy in this direction but I guess what I was hearing was that it was a weakening of the protection for the public from the standpoint of the mines not having to clean up as much.

GARY BEACH, WQD: Let me try and give my take on it and Steve may correct me. I think when you strictly look at public health and safety, I would not advise the public to go out and drill a well in a uranium ore zone and use that water for their domestic use. So when I look at it from that perspective, don't consider this water to be the kind of water we should be protecting for drinking water sources or encouraging the public to use them for that unless you've got a big municipal system that can deal with this kind of waste and water but we don't have that right now, we don't have that demand in Wyoming. What Steve is referring to is that if you take away the treatability for radium, if you remove that, if you decide you're not going to apply that policy to the waters in these mineralized zones, the classification of them then becomes industrial water. They drop to a classification of industrial waters. If you look at our rules, Table 1 with respect to standards, there are no clean-up standards other than 10,000 ppm TDS. What Steve is saying is what he called sacrifice zones. What he's saying is there are no standards then that you have to clean up to.

BOARD MEMBER GAMPETRO: But don't they still have to go back to whatever it was to start with?

GARY BEACH, WQD: Right. They have to apply Best Available Technology (BAT). They first have to try to go back to background using BAT. If they cannot achieve that, they have to achieve at a minimum, class of use. The class of use in the production zone is a Class IV industrial use which has no minimum requirements other than 10,000 ppm TDS which just doesn't affect them. What's really gonna drive them then for clean-up at a minimum is the adjacent waters. If the adjacent aquifer is a Class I they have to clean up the production zone to a level that it's not going to affect that adjacent Class I aquifer. That's what's really gonna drive the clean-up if BAT doesn't achieve something higher. I don't consider it a sacrifice zone. I think we will see clean up because you're going to have to protect the adjacent aquifers. I think we also need to realize that we probably shouldn't be representing these waters in the mineralized zone are Class I waters for public use as drinking water.

STEVE JONES, PRBRC ATTORNEY: Mr. Chairman, you have to remember that we're talking....again radium seems to be the main constituent of concern so if you've got, in this adjacent zone that Gary is talking about, the quality of water that has radium, let's say 25 picoCuries per liter which is eminently treatable at 25 picoCuries per liter, that's the only problem is that it's going to be considered Class V. At least that's what I'm gathering from what Gary is saying is that they're not going to consider that treatable so it's above the 5 picoCuries per liter which is the standard for Class I, II, and III which includes agricultural use and livestock and all that. If any of that water is above V, even though it's eminently treatable, it's just going to be regarded as industrial use water and that's it. So, you're going to be depriving any potential user from treating that water so he can use it to drink it or so he can use it to water his livestock or water his crops or whatever. All those things are going to be wiped out. Admittedly, only Class I has this provision about economically practicable to treat and so forth but if you're living out there on a ranch somewhere you may want to do all three of those things with that water. Maybe if you want to be more careful, and Gary may be right, being careful is a good idea, maybe you want to have a little pump house disassociated from where you're living to where you filter that water so that if you have any radon gas associated with that filter that that is separated from where you're living. What I'm saying is by adopting this policy you're removing those options from ranchers. They're not going to have that option anymore because I would think that the water is going to be well above 100 picoCuries per liter in a production zone and that's just going to be left that way because of course there's not going to be any standards for that.

MARK MOXLEY, LQD: Mr. Chairman, I want to return briefly to this concept of the production zone and point out that the statute defines the production zone as the geologic interval into which recovery fluids are to be injected or extracted. To me that means that's the area that's going to be impacted by this in situ leaching operation. If we extend that production zone all the way to the monitor wells I still think the LQD would then be obligated to bond that entire area for restoration. If we're going to define that as the area that's going to be impacted I don't see how we can do otherwise. So, I see a real conflict here in the way that the industry wants to define that production zone. I think it's going to create problems.

BOARD MEMBER MUNN: My question for the industry people is how large are these flares from the injection wells? I mean, we've got a 500 foot maximum monitoring ring out from your production area. Are the flares typically going out, and I guess it would vary with aquifer characteristics, but 200 feet, 100 feet?

PAUL GORENSON, RIO ALGOM MINING CORP.: It just depends on the geometry of the ore body as well as the pattern. It can vary from depending on 50 to 150 feet as to what's going on. I don't think we've ever run a model or anything like that which shows a hypothetical where reaching out to the monitor wells at all. It's typically very close to the monitor well. It's usually within the distance that's equivalent to the distance between the injection production wells. I think I saw in the package a 5-spot diagram, and this is between these two injection wells, could be 100 feet. It's conceivable that flares could go out maybe 75 feet or even less actually as it comes back into the production zone because the well is here, it's pulling water in and so the flares could conceivably come out here and then come back in 50 to 75 feet out could possibly be the limit. It's hard to say because what you're looking at is modeling which is very theoretical and assumes that everything be an equal. It's a very small fraction of the whole pattern area. When you have an excursion that you detect out here, that means something has gone out of control. That's what the whole point is that you want to catch it before it impacts the adjacent groundwaters or at least be able to

protect it. Typically, when you restore a well field, if you get a lot of impacts out here which you would measure by how long it takes to clean it up. You'd just keep pulling in more water and have to continue to clean it up. Any plume that impacts the water outside of this pattern would be coming back in as far as restoration anyway and you would see that as your trends are coming out of your clean up.

BOARD MEMBER CAHN: How do you determine spacing for the 5-spot pattern?

PAUL GORENSON, RIO ALGOM MINING CORP.: It's strictly economics. You use modeling to determine which ? time is between the two...what it takes to get between here and here. You're injecting oxygen and there's a ? ? to it. The oxygen will be consumed as it's being pushed to the ore body and so that will be the distance between here and here which is determined on the formation of characteristics, how permeable is a sand stone, how porous it is, what's the ore grade, etc..

BOARD MEMBER CAHN: I'm having a hard time understanding...in order to develop the production zone and ore body you need to do modeling in order to determine where you're going to put your 5-spots....where you're going to put your wells. Why is it an onerous task to continue that modeling to go out to look at.....

PAUL GORENSON, RIO ALGOM MINING CORP.: Let me explain, not everybody models this way. I mean, you develop an experience. If you're doing it basically on a green field type operation where you're just coming into something where you haven't operated before you want to determine what your economics basing is, you could use modeling. I'm not saying everybody does it. I'm not advocating that everybody does it. Some people may and some people may not. However, when you set your pattern spacing and maybe this would be on experience, this is what other operators in the area have done or maybe this is what you as an operator have done elsewhere that's worked for you so you may choose to use that type of a pattern. When we're talking about modeling in this proposal, it is entirely different. It's spaced to model your fate and transport of the constituents of the impacted waters in the production zone and how they possibly can impact the adjacent groundwaters. I think that's what we're talking about here.

BOARD MEMBER CAHN: What would your typical boundary conditions, let's say, be for modeling if you would want to show your company that this is economically beneficial to develop? How far out would typical model be in terms of (voice faded).

PAUL GORENSON, RIO ALGOM MINING CORP.: Timing wise or as far as what boundaries have we set to.....

BOARD MEMBER CAHN: How large is your model going to be? What area would you typically go out to? You have to have some kind of a boundary condition to set in your model.

PAUL GORENSON, RIO ALGOM MINING CORP.: There's different kinds of models we use. You can use.....

BOARD MEMBER CAHN: Okay, what's the domain, what's the area that you would....

PAUL GORENSON, RIO ALGOM MINING CORP.: We try to focus on where we're at in the

pattern, the ore body and it's set by grade of the ore, in other words, what's going to be recovered or what's potentially able to be recovered. It's also set by what experience has shown as being the timing. In other words, the model can be a simple spread sheet, an economic spread sheet that shows that this is how long our experience says it takes for pore volumes to circulate through and this is how long our experience says it takes, how many pore volumes it takes to get economic recovery of the reserves there. You may use a hydrological model to adjust those concepts but typically most, at least in my experience, I can only speak from that, is that the pattern spacing is generally set by what your experience shows as being the best approach. The models you use are typically a store of decline curves. You know what the groundwater chemistry is going to do during operation because you have previous experience, you can factor that into the model and you use the decline curve say for, we'll say a key constituent for modeling is uranium, because that's what we're producing. We know what it's going to do historically. You'll have experience in the area of core studies and core column testing etc. that will be used to determine what your economic recovery is and knowing the ore body characteristics and aquifer characteristics you'll determine what your optimum spacing would be between wells. You would have to factor in economics - how much does it costs to get each pound out of the ground?

BOARD MEMBER CAHN: I guess my question really was would you always use a hydrologic model in any case to determine (voice fades).

PAUL GORENSON, RIO ALGOM MINING CORP.: No, not always. It's strictly up to the operator. It's what the operator chooses is the best approach.

BOARD MEMBER MUNN: Could I ask you, if it's not an industrial secret, what level of uranium is required before a company would consider developing a field and what's left behind is unrecoverable typically?

PAUL GORENSON, RIO ALGOM MINING CORP.: Most of the ISL well fields run technically between, let's say about .3 - 2 % grade?

DONNA WICHERS, COGEMA MINING: You have a very high grade ore body.

PAUL GORENSON, RIO ALGOM MINING CORP.: Well maybe .1 %. Maybe I'm confusing GT's. It's relatively low grade compared to what your conventional mines are so .1% is typically where it's at. Depending on your economics, the cost it takes to recover and the cost of your self rise will determine what percentage you'd get out of what you believe is economically there. An 80% recovery is probably what one would put into their economic model for that particular ore body and pertaining to what your cut-off grade is would be your deciding factor.

BOARD MEMBER MUNN: But you're not going to be trying to extract uranium from Class I water typically anyway are you?

PAUL GORENSON, RIO ALGOM MINING CORP.: No, typically what's put there is not Class I water. It's usually uranium laden water that over millions of years has precipitated out to some event that caused a reduction oxidation contact point that has caused the uranium to precipitate out. It's naturally mineralized there anyway so your mineral constituents are significantly higher in any ore body than it would be in say your typical barren or non-mineralized Class I.

JILL MORRISON, PRBRC: Is it correct that a good portion of what's is going on in the uranium mining area is restoration? If so, how successful is the restoration?

RICK CHANCELLOR, LQD: I think Irigaray and Christensen Ranch are in restoration. I think Irigaray submitted a revision which is ongoing.

I think PRI has one well field that I believe is restored and is under review. All the rest of PRI's are in production.

Rio Algom is in production or in the early stages of groundwater sweeps to do restoration.

Basically, one mine, Irigaray and Christensen Ranch operation is restored or in restoration. The other two are in production.....some restoration going on.

I don't know the numbers off the top of my head as far as how far they've cleaned things up.

DONNA WICHERS, COGEMA MINING: I can speak to the Irigaray operations. In many cases when you look at parameter by parameter, we've restored very close to background and we have met class of use on a whole within the production zone.

BOARD MEMBER SKINNER: From my simple way of looking at this from a water quality point of view, is what you've really done is enlarge the area that industry is responsible for cleaning up because you're going clear to the well field. Any contamination that's moving out of there has gotta start from the area of clean up which starts from the highest concentration and backs it off so that you have less chance of something getting past a well field to the outside. They've really maximized protection for the public by increasing that area. They've taken a non-defined buffer area, concentrated their clean-up from the center, if anything crosses that well field, they're responsible for that increased area. I've never seen EPA real lenient and they would want everything done with that area. All they've done is increased their real focus responsibility to a larger area of the well field that goes around it. Am I right?

MARION LOOMIS, WMA: Mr. Chairman, I'm not sure I followed your discussion but you're correct that they're responsible for what happens inside of that those wells. The other point I would make that we kind of lost track of is none of this changes any of Rick's regulatory authority or the permit or the regulations that have been adopted. It's a clarification of the policy on how to determine suitability. That's the primary goal of this policy change.

RICK CHANCELLOR, LQD: On the risk discussion, I think that raises a lot of questions and uncertainty since it's a new law and we're not sure how it would apply in this case. I guess my recommendation is to drop the language proposed by WMA on the risk assessment.

I also have a question on the paragraph that talks about the restoration plan. It talks about using BPT and it goes back to the permit as to what is defined as BPT. Some of these permits are 15-20 years old and technology has advanced over that time and some of the original permits had so many groundwater sweeps, so much of this so much of that, and through experience industry has learned that there are better ways of doing things. My concern about tying it solely to the permit language may restrict not using what is BPT because an operator over here may have tried something new and it works real good. Another operator

may say it's not in my permit so I don't have to do it but we know that is an effective way to clean up the groundwater. So, I'd like to see some flexibility in there to allow the use of proven technology in those clean-up cases where they're having trouble getting things cleaned up.

BOARD MEMBER SKILBRED: Rick, how many permits are in existence that right now have probably never been amended? How often are these amended? In other words, how often does the department get the opportunity to review them? Are there any out there that wouldn't go through an amendment?

RICK CHANCELLOR, LQD: Robbie?

ROBERTA HOY, LQD: There's not usually an amendment for adding new lands. You don't generally amend it that way. There are revisions if you add a new well field. If you want to change the fluid that you're injecting. There's a range of revisions. They could revise the type of restoration they're doing.

BOARD MEMBER SKILBRED: At that point, would you get the opportunity to bring in BPT?

ROBERTA HOY, LQD: You could if the revision was addressing a restoration issue then you could probably address the BPT but if you're talking about a monitoring requirement and the department wants them to change their BPT then it might be a little more difficult to reach that far.

BOARD MEMBER SKILBRED: Okay, I'm not familiar with that permitting process but I was just wondering if there was an opportunity for the department to look at BPT throughout the life of that mine permit.

DONNA WICHERS, COGEMA MINING: Chet, during the annual report and the bonding evaluation may be the time because obviously restoration is a big part of the bond.

RICK CHANCELLOR, LQD: Maybe Robbie can answer the question I have on the proposed new rules on in situ to follow EPA's requirements. Is there something on there about review of the permit every so often?

ROBERTA HOY, LQD: They do.

STEVE JONES, PRBRC ATTORNEY: I have one more comment regarding the Wyoming Mining Association proposal. They say on page 4 that *the use of risk based assessments to demonstrate protection of groundwater outside of the production zone shall specifically be allowed pursuant to 35-11-1605* which is Article 16 Voluntary Remediation of Contaminated Sites. It seems to me that to qualify as an eligible site under that law it has to be a site where releases occur before the effective date of the Article. I'm not sure that a lot of these would necessarily qualify. In any event, I think something like that is big enough that it ought to be left to the regulatory process rather than just a policy. If the department's going to do it they ought to make regulations concerning it.

DONNA WICHERS, COGEMA MINING: Mr. Chairman, the purpose of putting this language in here was really to give us another methodology of modeling. We're not asking to necessarily be part of this program. We're wanting to use risk based assessments to have that available to us as part of the modeling effort that we have to do. DEQ asked for fate and transport modeling. What we're really trying to do here

is to add an additional type of modeling and that's risk based assessment. We were struggling to find a place in the statutes or somewhere that described this and this was the section that everyone is familiar with in DEQ. So, that's why we suggested this type of language and to be able to have that methodology available to addition to the fate and transport modeling that we can show that we have met the standards.

PAUL GORENSON, RIO ALGOM MINING CORP.: I was just going to add that it's not been uncommon during the annual report process and the bonding review to have your restoration plan addressed as far as that review.

BOARD MEMBER GINGERY: I'll see if I can summarize some of this but as I see, today in the last couple of hours, is that there is three things presented to these two boards: 1) the Wyoming DEQ's proposed policy of groundwater and classification on in situ, 2) the letter and the policy rewrite by the Wyoming Mining Association and, 3) the delay of any action on this at this time to give the public more input into these proposals. I believe the difference between the DEQ's proposal and the WMA's proposal is that WMA had four general areas that have been discussed. I wonder if my colleage Gene would like to take this input we have and look at the differences there and have discussion between the two boards of the differences between the DEQ's proposal and the Mining Associations' in order to come to some clarity on that. Would that work?

BOARD MEMBER GEORGE: Yes.

BOARD MEMBER GINGERY: You have the DEQ proposal and then the Mr. Loomis provided us their proposal and as I understand there's no change in the introduction so we can move on to the groundwater classification within and outside the production zone. Rick, I think you have a comment.

RICK CHANCELLOR, LQD: One of the comments was a concern of does this apply to the upper and lower monitor well area. It would not so maybe we could add some language to clarify where we talk about the production zone going out to the monitor well ring we're talking about only the ore body aquifer and not the aquifer up and below. Just some clarification language.

BOARD MEMBER GINGERY: Gary, are you in agreement with Rick on that?

GARY BEACH, WQD: Yes.

BOARD MEMBER CAHN: I have a clarification that I need in the introduction. Is radium similar to calcium and sodium? I guess I need a little help on the water softening process. We're gonna change with sodium and salt and you'll get the radium precipitating out.

OSCAR PAULSON, KENNECOTT URANIUM CO.: Radium behaves like calcium.

BOARD MEMBER CAHN: That's what I was wondering. I'm a little confused as to what the home owner would do with not having a water softener. And then, Gary's comment was very effective in taking it out and I don't see the radon exposure in the shower because it can be post water softner. I need some help in understanding that part of the introduction.

OSCAR PAULSON, KENNECOTT URANIUM CO.: You have two issues of the water. You have radium and radon. Now, depending on how you treat the water for radium, for example, if you treat it with activated charcoal, you'd be removing radium from the water. Radium that's removed has to go somewhere so it'd go into the charcoal. So you will now generate a charcoal that is contaminated with radium and be radio-active.

BOARD MEMBER CAHN: Okay, help me out, the charcoal is surrounded by what kind of a medium?

OSCAR PAULSON, KENNECOTT URANIUM CO.: Hands-on, I've seen some filters that are set up as pressure vessels.

BOARD MEMBER CAHN: Okay, so you've got pressure surrounding it and the radium is a alpha emitter so it can't get out of that charcoal.

OSCAR PAULSON, KENNECOTT URANIUM CO.: Radium emits alpha particles when it decays. It also has a significant gamma energy associated with it's decay which you would wind up....let's say you were capturing radium on charcoal. You would be generating a gamma source at the point of treatment. You also have an issue of the radon in the water and depending on how you treat the water for radium, you may or may not remove radon. In fact in many cases the radon may go on through.

DONNA WICHERS, COGEMA MINING: You must remember in our ore bodies, we have extremely high levels of radon, radon gas, up to over anywhere from 1 million, in some ore bodies, to 12-15 million picoCuries per liter of radon gas and that will come into this home. You can remove radon through aeration but it's 85% effective. So if you're starting with 1 million picoCuries, you remove 85% of that, you still have a very high radon level to deal with in a home.

BOARD MEMBER GINGERY: Did that clarify that Lorie?

BOARD MEMBER CAHN: Yes.

BOARD MEMBER GINGERY: In the clarification of that first sentence, Rick, what wording did you feel we should add?

RICK CHANCELLOR, LQD: I don't have the exact wording in my head.

BOARD MEMBER GINGERY: Let me back up and ask the boards, are we going to accept the Mining Association's change of that first sentence under Groundwater Classification Within and Outside the Production Zone or do we stay with the DEQ's proposal?

BOARD MEMBER LABONDE: Mr. Chairman, my suggestion on paragraph one is that the first sentence as proposed by the WMA is not needed. I guess I would support in the second sentence where they delete the word *classification* twice, I would support that and insert *background conditions*. Then I would further support the additional language they've added to clarify production zone as everything inside the monitor ring. That's my thought.

BOARD MEMBER GEORGE: In regard to Harry's comment, the first sentence is simply moving it from one position to another. It's not an addition. I think the consequence of moving it is not important, it's just an attempt to show it up front that you're dealing with Class V. If it would make is simpler to leave it where it is, I think we could leave it where it is and make the modifications that Harry was talking about which does include the production zone out to the monitor well ring and I think at that point you should say for the aquifer containing the ore body.

BOARD MEMBER GINGERY: Okay. Larry, you looked like you wanted to comment?

BOARD MEMBER MUNN: I just wondered if in the fourth paragraph where it says *regardless of the restored groundwater quality in the production zone, the adjacent aquifers and other waters within the same aquifers*....the adjacent aquifers... that's referring to the aquifers above and below, is that not?

BOARD MEMBER GINGERY: That'd be my understanding that it would.

BOARD MEMBER GEORGE: Yes.

BOARD MEMBER GINGERY: Sticking with the first paragraph even though that first sentence had been moved I did get a few members consensus we'd leave the first sentence in the DEQ's recommendation and we'd make the two changes I believe Harry had.

BOARD MEMBER LABONDE: In the first paragraph I would endorse all of the changes by the Wyoming Mining Association with the exception of that first sentence in their draft. As Gene as pointed out it's contained on the second page so I don't see any need to duplicate it.

BOARD MEMBER SKILBRED: It was amended though, right? The area within the production zone monitoring ring...

BOARD MEMBER GINGERY: Yes.

RICK CHANCELLOR, LQD: Where the aquifer contained the ore body.

BOARD MEMBER SKILBRED: Okay.

BOARD MEMBER GINGERY: Okay. Let's move on. The second paragraph prepared by the Mining Association....does anyone have any problems with the wording they proposed?

BOARD MEMBER LABONDE: Mr. Chairman, I'm kind of echoing some of Rick's comments, when we start to relay a new standard back to restoration in an approved permit that could be as much as 15 years old, I think that's really not recommended. My thoughts are that we stay with the language that DEQ developed.

BOARD MEMBER PROFFITT: I concur on that.

BOARD MEMBER GINGERY: Right now I have a consensus of the second paragraph that we'll just stay with DEQ's recommendation. The third paragraph....Rick could you get us through this one?

RICK CHANCELLOR, LQD: The issue was the class of use of the groundwater outside the production zone. The thought was to maybe change that sentence to highlight that they're talking about outside production zone. When I first read it I thought it meant class of use and we have concerns with that but they're talking about class of use outside the production zone. Maybe it's okay once we understand what their meaning is. Maybe it could be presented better but now that we know what they mean it makes more sense. This is the third paragraph where they talk about BPT.

BOARD MEMBER LABONDE: Mr. Chairman, I read the proposed language by the Mining Association and I understand what they're trying to do. They're saying if the production zone ore cannot be returned and there's a potential for an effect outside of the production zone then this modeling can be used. Then I go back to the language that DEQ has proposed and I think it does that as well. Reading from the DEQ version, the second sentence, third paragraph it says, *flow models and fate and transport models shall be used to assist in determining if the restored groundwater in the production zone poses a threat to groundwaters class of use outside the production zone*. I think that language does cover what we would use that model for. To me it was clear. Again, I would suggest that there's no need to change

BOARD MEMBER GEORGE: I still have a concern Rick because is it the intent that we would require them to always model?

RICK CHANCELLOR, LQD: The intent was that if they did not achieve background that modeling would always be required. Their proposal is that if they don't achieve background but do achieve class of use of the water outside at the monitor well ring, then modeling would not be required there either.

BOARD MEMBER GEORGE: Is that a problem or a concern because there is a difference to me in the language.

RICK CHANCELLOR, LQD: There is a difference, yes. I don't have a problem unless the staff knows something more than I do which is quite often they do.

STEVE INGLE, LQD: Modeling typically takes a very complex geochemical system and then simplifies it to where the model can actually handle it. There may be some parameters that are elevated after mining that were not elevated before that which can mobilize undesirable metals for example.

ROBERTA HOY, LQD: The concern is in premining you have very sharp delineation between your....in terms of water classification and oxidation reduction conditions and that sort of thing. There's some gradation but in a larger hole that's fairly sharp. You're changing the conditions within the well field and when you restore it, you're not restoring it necessarily back to the way it was so as Steve was saying you may have changed conditions such that....because this mobilizes many parameters not just the uranium. You need to be sure and understand what's happening with those other parameters as well. Whether it would require modeling in order to be able to determine that the fate and transport....some parameters maybe not, but for others it would probably be helpful to be sure you thought through how you changed that system within the production and injection zone because it isn't just uranium that you're mobilizing. You're really changing those entire (voice fades).

BOARD MEMBER GEORGE: So even if they reach their class of use, you still want modeling? You want fate and transport modeling?

RICK CHANCELLOR, LQD: Let's assume that water at the monitor well ring is a Class I. In order to not do modeling they have to restore the production zone to a Class I. I understand your intention there. You didn't achieve background but you did achieve the same class outside the production zone at the monitor well ring, therefore the protection of the Class I outside is Class I inside and shouldn't have any elevation there.

ROBERTA HOY, LQD: I guess I'm not sure I understand that.

RICK CHANCELLOR, LQD: Okay, if you have Class I water at the monitor well ring and they restored the production zone and did not get back to background but they did restore it to Class I, class of use which is the same as the monitor well ring.

ROBERTA HOY, LQD: But if you had Class III, Class II....

RICK CHANCELLOR, LQD: So if they're equal classes between the production zone and the monitor well ring they're saying they don't want to do modeling because they shouldn't be impacted.

BOARD MEMBER LABONDE: Mr. Chairman, I want to read the DEQ proposal again because I think it does exactly that. *Well models and fate and transport models shall be used to assist in determining if the restored groundwater in the production zone poses a threat to groundwaters class of use outside the production zone*. I think in that circumstance industry owes us the modeling to show that this threat is not significant.

BOARD MEMBER GAMPETRO: Yeah, but you're reading it different than I am. If you said, if the restored groundwater in the production zone poses a threat to groundwaters then flow models and fate and transport models must be used....that's different than what's said here. What's said here is flow models and.....they're gonna use them irrespective of what the situation is to determine if there's any threat. I think you were reading it the other way.

BOARD MEMBER LABONDE: He's reading it as a two-step process.

BOARD MEMBER GAMPETRO: It's an if/then the way he's reading it. I'm reading it the way he's reading it which is they're going to use these models whether there's a threat or not. I'm not making a value judgement on that. I'm just saying that's why I hate dealing with words in meetings because everybody reads them differently.

BOARD MEMBER LABONDE: I guess I would defer DEQ's intent.

RICK CHANCELLOR, LQD: Our intent was that if they did not achieve background, modeling would be required.

BOARD MEMBER GAMPETRO: Then we need to say that.

BOARD MEMBER PROFFITT: Mr. Chairman, I like the two-step process. I like the intent that was read into it.

I wanna go back up to that first paragraph that we considered and look at that last sentence where it says *using the revised policy, treatability of radium will not be considered in the classification decision either within or outside the production zone*. I'm wondering how that translates if we're going to do modeling. Why would we leave radium considerations outside the production zone on these models? You've gotta have those backgrounds and as I understand the monitoring wells, each one of those has it's own criteria set up so you're looking at ambient standards. It seems to me that we ought to leave the radium inside the production zone and take that language out that leaves it outside the production zone otherwise your modeling is thrown off.

BOARD MEMBER GINGERY: So you're saying that last sentence in the first paragraph under, Groundwater Classification Within and Outside the Production Zone, contradicts what we're trying to accomplish in the third paragraph?

BOARD MEMBER PROFFITT: That's right. Your modeling goes hay wire if one of the key elements you're looking at is not allowed to be considered.

BOARD MEMBER MUNN: I don't think it's saying that. I think it's just saying that you won't say it's Class I water because it's got high radium but we can treat radium. Now if it's got high radium it's gonna be Class IV or whatever. It's going back to that issue of whether they want people taking radium out and then taking the salts to the dump or the charcoal or whatever they're dashing under their house or whatever they would do with that.

BOARD MEMBER GAMPETRO: It's the treatability that's not being considered, not the radium.

BOARD MEMBER MUNN: Yeah. You would still model radium with all the other elements if modeling was required.

BOARD MEMBER SKILBRED: On the third paragraph where we're trying to determine whether they apply or don't apply or when they apply and don't apply. Some of us feel that within that verbage it says we cover all the basis but looking at the WMA's language, what's offensive about it? It defines it pretty specifically. If after the application of BPT the groundwater within the production zone cannot be returned to background or class of use of groundwater outside the production zone then you'd apply these models. It defines exactly what's gonna happen here or when to apply it.

BOARD MEMBER GAMPETRO: I would agree except it discontinues the use of flow models for whatever reason.

BOARD MEMBER SKILBRED: I guess I'm ignorant as to what a flow model is.

BOARD MEMBER GAMPETRO: So am I but that's the difference between the two versions.

BOARD MEMBER SKILBRED: To me, it's saying the same thing.

BOARD MEMBER GINGERY: Larry, on the flow model, you deal with this type of subject all the time, what does that really mean to us here?

BOARD MEMBER MUNN: I would think that fate and transport models are pretty inclusive if the water's flowing you're going to have to be aware of that in the transport models so I think it was a little bit of perhaps redundancy in specifying them separately.

BOARD MEMBER GEORGE: Rick, do you have a problem with the Wyoming Mining Associations language?

RICK CHANCELLOR, LQD: I don't have a problem except for I would think the flow model in some cases would be appropriate because we had some permits where the original direction of groundwater flow may be different than what we think it now is from before twenty years later. Maybe Robbie can supply some input on that.

BOARD MEMBER GEORGE: So you would have no problem with it if we put the word flow models back in?

RICK CHANCELLOR, LQD: Right.

BOARD MEMBER GEORGE: Okay and the Wyoming Mining Association has no problem. So as the captain says. make it so.

BOARD MEMBER CAHN: It's a little redundant if you can't have a fate and transport model without a flow model.

BOARD MEMBER MUNN: I had a question on the language. I think most of the monitoring wells for the production aquifer are going to be Class IV. They're going to be radioactive right.

AUDIENCE: No, not necessarily.

RICK CHANCELLOR, LQD: Most of the monitor wells are Class I. because they're outside the mineralized zone so they're pretty clean.

BOARD MEMBER MUNN: Okay. So I assume you're going to take all the uranium you can or have as big a field as possible and then they will be bounded by Class I.

BOARD MEMBER GEORGE: Whatever those were when they were started is what they have to be returned to.

RICK CHANCELLOR, LQD: Right.

BOARD MEMBER GEORGE: That's what the monitor wells are supposed to be kept at their current class even during the operation.

BOARD MEMBER MUNN: But if your monitor wells are Class IV then this is saying that that's the only thing you have to refer to. It says production zone cannot be returned to background or to the class of use so if you have Class IV then you don't have to go to background, you just have to go to class of use. Class IV just says 10,000 ppm solids? Is that it?

RICK CHANCELLOR, LQD: The goal of restoration for the first standard, it depends on how they read the rules, is to go back to background. As you clean the water up, you may not be able to get back to background but the minimum is you have to get to class of use in the production zone. What they're saying here is if they clean it up so clean that it's not background but yet it's the same class of use as water in the monitor well rings. Modeling should then not be required because it's the same quality of use.

BOARD MEMBER GAMPETRO: Could I suggest something? Why don't you just go with what you have here and reverse it....if the restored groundwater in the production zone poses a threat to groundwaters class of use outside the production zone then flow models and fate and transport models shall be used to assist in determining if the restored groundwater poses that threat.

BOARD MEMBER ?: I'll second that.

BOARD MEMBER GAMPETRO: It appears that that's what you're intent was. That way, you can use them when you need to use them but they don't have to use them all the time.

BOARD MEMBER LABONDE: A threat has to be determined if there's a perceived threat, modeling is appropriate.

BOARD MEMBER GAMPETRO: There's a triggering mechanism and that's really up to the staff if you see that threat.

DONNA WICHERS, COGEMA MINING: Well I think we were just trying to clarify this so that we all knew what we were focused on here. We were just using common sense that if we restore our field to background, why do the fate and transport modeling? Again, if we restore our field to the same use as the monitor well, why spend the money and the time and effort to do fate and transport modeling?

BOARD MEMBER GAMPETRO: But I guess what I heard this gentleman (Steve Ingle) over here say was that there are situations where you could restore that to it's background level or it's class of use and still pose a threat because of the disturbance that had occurred. Unless I misunderstood you sir. He's nodding yes...because of the disturbance that had occurred during the mining process there could still be a threat to the outside water in which case he would like to see flow and transport modeling.

DONNA WICHERS, COGEMA MINING: If we restore to background and you're saying that's still a threat.....

BOARD MEMBER GAMPETRO: I'm not saying....I'm quoting the gentleman with the mustache.

DONNA WICHERS, COGEMA MINING: It's a threat at premining.

BOARD MEMBER CAHN: I think it's more of the restoring to class of use than restoring to background.

DONNA WICHERS, COGEMA MINING: But again if the water outside the well field is Class III and we restore it to Class III, what is the threat?

BOARD MEMBER GAMPETRO: The threat is that the hole is all different under there. The aquifer is all different. You've run water through it. You've removed things from it. Things are different. That's what I would understand.

BOARD MEMBER PROFFITT: I could see where restoration would be a slice of time and you'd establish that but because of the changes that occurred because of the mining process the fluid overtime is going to change that would allow transport and still have a continuing threat.

BOARD MEMBER GINGERY: I think Jim and Harry came to some kind of conclusion there. How do the rest of us feel about it? I'm not to sure we got the wording there.

BOARD MEMBER GAMPETRO: Yeah, my intent was if in these professionals judgement there's a threat then we do the modeling. If there isn't, we don't do the modeling which would hopefully be satisfactory to all parties concerned.

BOARD MEMBER LABONDE: As written, it's a threat to the class of use....to the outside aquifer. I think we're talking about the same thing and I like the changing of the sentence and I think it really accomplishes what we're trying to do.

BOARD MEMBER GINGERY: So in this sense, it almost becomes an administrative call at that period of time if you're going to have to model. Is that correct?

BOARD MEMBER GAMPETRO: Rick has tremendous power.

STEVE JONES, PRBRC ATTORNEY: I'm a little confused because it seems to me that if this outside water that's outside the production zone is above 6 picoCuries per liter and I'm taking it from the discussion that that's what it's almost likely to be for radium because it's close to these uranium ore bodies and so forth. It's above 6 picoCuries per liter for radium then they're going to regard this as Class IV which doesn't really have any standards because for Class I, II, and III 5 picoCuries for radium is the limit. So if it's regarded as Class IV it doesn't have any standards applicable to it other than TDS. So I don't understand what the point of transport and flow rate and all that modeling is if you're not going to require them to bring it back to any particular standard. I need some clarification.

BOARD MEMBER GAMPETRO: The intent was to protect the water outside of that area.

STEVE JONES, PRBRC ATTORNEY: But to what standard?

BOARD MEMBER GAMPETRO: If there's a threat to the water.....Rick says most of those outside monitor wells are I's, not IV's.

PAIGE SMITH, LQD: But will that change now with this treatability being removed?

RICK CHANCELLOR, LQD: Maybe industry or Robbie or Steve can answer that as far as when you look at the parameters for the monitor wells, what is radium typically?

DONNA WICHERS, COGEMA MINING: It depends on the operation and how the ore body goes. You could actually out in front where you're not mining have a completed ring and those monitor wells are in the ore body because you're advancing and yeah, they could be Class IV.

RICK CHANCELLOR, LQD: But the outside ore body most likely is Class I.

DONNA WICHERS, COGEMA MINING: But those that are outside, at our operation, the majority of them are Class I. We may have some Class III and there may be radium with 6 picoCuries per liter but in our case, we're typically below 5.

STEVE INGLE, LQD: As Donna said, some of these wells in some areas are Class III and this is the economic ore body. A lot of times these fronts will go for miles and they will intersect the monitor well ring. So there can be wells in the monitor well ring and I think we've seen some in these operations where you do have radium that's present above 5 picoCuries per liter at the monitor well ring.

BOARD MEMBER SKINNER: Never the less, each one of those wells is treated separately so you're restoring water back to the class of use. The modeling, if you're working for DEQ and the industry, is trying to restore that aquifer, the industry and the DEQ may sit down and say let's look at some transport flow models to see how close you're coming to restoration. Once you've restored it you've dropped that level down and you've looked at the bottom of that curve and you say okay, things are okay now, let's not spend any more money or time on this model. This suggestion says that eventually or if something happened and you had a threat, you could go back to the modeling because you're still responsible for the restoration of those aquifers. Am I right?

DONNA WICHERS, COGEMA MINING: Yes.

BOARD MEMBER GEORGE: Until the bond is released.

BOARD MEMBER SKINNER: I don't see the pros and cons of whether you're going to model or not going to model are really that important. Initially, you may have to do flow and transport modeling to prove your case.

BOARD MEMBER GINGERY: Roberta, have you had incidents like that where you hit a certain level and then you have to come back and do modeling?

ROBERTA HOY, LQD: There's been one....well we haven't really addressed it. There is one that I can think of that we're reviewing and is still under discussion in terms of restoration. It was the operators initiative to do modeling to demonstrate what was happening in that instance. We haven't necessarily asked for it. It's been done in the one instance that I can think of but not in the others. What I started to do but didn't get it done is to look at how much difference it would make in terms of classification between whether you included 100 picoCuries per liter or not. In terms of the wells in the monitor well ring, let's say out of 20 wells, 19 of them were Class I with the radium treatability standard of 100. If you don't have the 100 and it's only five then you might have 17 wells that are Class I and then the others would be Class IV. That's only based on about 2 well fields. It does make a difference but I couldn't tell you in terms of having gone through all of the well field data which I haven't done yet.

BOARD MEMBER GINGERY: So from what has taken place, when industry see's that problem, they're going to switch to modeling anyway to try to resolve the issue as has been past/present practice.

ROBERTA HOY, LQD: Just in the one I mentioned. In terms of well field restoration packages there's only been two submitted, right Steve?

STEVE INGLE, LQD: Right.

ROBERTA HOY, LQD: Of those two, one choose to do modeling.

BOARD MEMBER GINGERY: I think we've had clarification on this. Unless somebody disagrees, we'll stick with Harry and Jim's recommendation.

BOARD MEMBER SKINNER: Jim, could you repeat what you said?

BOARD MEMBER GAMPETRO: If the restored groundwater in the production zone poses a threat, flow and fate models and transport models shall be used to assist in determination of that threat...what needs to be done I suppose would be better wording. Determination of what action needs to be taken.

BOARD MEMBER LABONDE: Jim, I think you need to include the rest of that sentence.

BOARD MEMBER GAMPETRO: You're right. Threat to groundwaters class of use outside the production zone...right....then flow models and fate and transport models shall be used.

BOARD MEMBER LABONDE: And so it's real simple from the industries stand point, you clean it up to BPT or to background standards and no modeling is required. But if your by-product of the mining is posing a threat to the class of use of the groundwater outside that zone, I think modeling is entirely appropriate.

BOARD MEMBER GAMPETRO: I guess my understanding is that even if it's cleaned up to that level, if the hydrology of the situation is such that the disturbance has been such, it could still require modeling. That's what I heard the one gentleman say anyway.

?: Well it comes back to the class of use of the outside aquifer.

BOARD MEMBER GAMPETRO: If it's a threat to the class of use of the outside aquifer.

BOARD MEMBER GINGERY: Are there any questions on paragraph three? If not, looking at the Mining Association's proposal there, they added a fourth paragraph of information while the DEQ did not have that information. Where does the group stand on that?

BOARD MEMBER GEORGE: Rick, you had some specific comments about that didn't you?

RICK CHANCELLOR, LQD: My concern is that the Voluntary Remediation Program is fairly new and we have not had much experience as to how it would or could apply to in situ. My gut reaction is that we should leave it out until we have more experience in other programs as to how it works to see if it would work here. Gary's comment was that to change that word *shall* in the first sentence to *may* because again, I think Gary stated that he wasn't sure if they could apply that in all cases or if they could apply it at all.

BOARD MEMBER LABONDE: Mr. Chairman, I think what we're doing in this paragraph is restating the Environmental Quality Act and I guess I would question why we would want to do that in a policy document. The language is there, it's in the Act, DEQ has to enforce that as it is written so why bring it back into this policy statement?

BOARD MEMBER GINGERY: Gary, how do you feel about this?

GARY BEACH, WQD: I think you could just do the reference of 35-11-1605, Article 16 and stop it there and not recite what's in the Act.

BOARD MEMBER CAHN: I'm confused again. Are we saying that it may not apply but this is going to be allowing this to apply?

BOARD MEMBER SKINNER: No. They have an option to look at that if.....

BOARD MEMBER CAHN: If it applies within the Act.

BOARD MEMBER GINGERY: I think if I understand Lorie, I think they're trying to get some history or find out how it works in the whole industry and it may or may not be suitable for this particular industry but there may be the opportunity.

ROBERTA HOY, LQD: I have a question in terms of trying to apply the policy because it almost seems like you're creating a contradictory situation because you have standards that talk about class of use in the previous paragraph and then all of a sudden you're switching over and saying risk assessment. You're switching between types of regulations if you will. There are standards set and all that's talked about up here and then all of a sudden you're switching gears and talking about risk assessment. In terms of looking at 1605 someone brought up the eligibility criteria and it isn't clear that these sites would be eligible in terms of the way the statutes written. To me, in terms of trying to read the policy and being the one to interpret it and try to regulate it, it would really create a contradictory situation to me.

DONNA WICHERS, COGEMA MINING: Mr. Chairman, again, I think the key words to this paragraph are: *the use* and then *of risk based assessments.* We're not necessarily wanting to be part of Article 16. We want to be able to use a risk based assessment as another tool. If there's something that poses a threat, we'll do flow models, fate and transport models. We want the ability to also use risk based assessments. That's all we're asking for here.

RICK CHANCELLOR, LQD: In your concept using the risk based, are you looking at what's the risk to that class of use or are you saying risk to humans or animals?

DONNA WICHERS, COGEMA MINING: Well that's why we included the language so that everyone could see what it is that....it's really looking at the risk to human health. Now if someone thinks we should look at livestock...that's certainly....

RICK CHANCELLOR, LQD: I guess my concern would be that if the standard is class of use and you decide to base your risk analysis...that if you leave it like it is, it won't impact humans or animals, you may still impact class of use but yet the risk says you're okay therefore you don't have to do anything. I think that's our concern.

DONNA WICHERS, COGEMA MINING: No, we still have the standard of use but if you think it poses a threat, we want to be able to tell you that it does not pose a threat and this would just be another tool.

BOARD MEMBER CAHN: I have a lot of heartburn with this part because of the wording: *use of risk based assessments to demonstrate protection of groundwater outside of the production zone*....that's a pretty large area..

DONNA WICHERS, COGEMA MINING: It's the monitor well.

BOARD MEMBER CAHN: It doesn't say that. It says *outside of the production zone*. For example, and tell me if I'm way off base, let's say you had a Class I groundwater monitoring well but there is no current use of that for domestic use and you decide that you don't have to meet the standard at that well because you can use a risk based approach and there's no receptor there. Then you could say it does have concentrations of this which...but a risk assessment is going to say the nearest receptor is at this location and they're two miles away so it's okay because we don't currently have a receptor here. That's the way I read this and I'm uncomfortable with it.

BOARD MEMBER GEORGE: Wouldn't you have the application of the Article 16? Wouldn't you have that if you qualified for it under any circumstance?

DONNA WICHERS, COGEMA MINING: If we qualified for this?

BOARD MEMBER GEORGE: If your property would qualify for Voluntary Remediation.

DONNA WICHERS, COGEMA MINING: We could always apply for that, yes.

BOARD MEMBER GEORGE: Okay, so regardless of whether it's in the policy or not, you'd be able to do that.

DONNA WICHERS, COGEMA MINING: That's right. We were, again, just looking at another tool and that's risk based assessment in addition to fate and transport modeling.

BOARD MEMBER GEORGE: I understand that but I perceive a problem here and I think the problem lies in trying to bring one Act in with another. It'd be my recommendation that we drop this one at this point since you would still be eligible under the Act assuming that your property would qualify.

BOARD MEMBER GINGERY: I get that people are in favor of your suggestion. We have gone over three paragraphs and I would suggest that each board vote on the suggestion here today unless there is more discussion.

BOARD MEMBER CAHN: I would like discussion on the treatability of groundwater to a Class I standard. Again, to me in terms of treatability for radium, there seems to be two issues: 1) the treatability by a home owner and 2) the treatability by a mining company. I don't think it's onerous at all for the mining company to treat radium since it can very easily be removed from water softening and the ion exchange type processes. The mining company is very used to handling radioactive substances and knows about disposal. I need some clarification in terms of what is this intended for, the mining company or the home owner? I understand Gary's concerns about it being potentially a health concern for the home owner to be doing this type of treatment but this isn't specifically saying that treataability.....that radium will not be considered as treatable due to concerns with the safe disposal of any water treatment by product. To me that needs clarification.

BOARD MEMBER LABONDE: Mr. Chairman, if I could clarify. This is referencing Section 5, Chapter 8 which means that it's pertaining to the classification of the water. It really does not involve treatability from the home owners stand point or the mining industry. It's when DEQ classifies that water and what they're saying is due to the hazards associated with radioactive by- products in the treatment process that if the radium is actually over 5 picoCuries that it would not qualify as Class I water. Previously, it would have been classified as Class I.

BOARD MEMBER GINGERY: If there are no more questions maybe Rick can tell us what was decided in those three paragraphs and then each board can separately vote on the acceptance of this document.

RICK CHANCELLOR, LQD: Starting under the Groundwater Classification Within and Outside the Production Zone, the first sentence that was moved by WMA will be moved back to it's original position in the Land Quality version.

The other changes proposed by WMA are accepted with the addition of the language after the *monitor well ring* to say *for the aquifer containing the ore body*.

The next paragraph strike out the proposed change by WMA and replace the language by LQD.

The next paragraph: reword the language submitted by WMA to what Jim stated. I didn't catch all of it but it's basically restructuring the sentence to clarify when there's a threat to the class of use outside the production zone then fate and transport modeling be required.

I wasn't clear on the flow models. My understanding was that it would be kept but there was also discussion that it was redundant but I think we said we'd keep it.

BOARD MEMBER GEORGE: And we would omit WMA's reference to Law 1605, Article 16?

RICK CHANCELLOR, LQD: Yes.

BOARD MEMBER GINGERY: We'll proceed at this time that each Chairman will poll their members. I would accept a motion from the Land Quality board on this document at this time.

BOARD MEMBER PROFFITT: So moved.

BOARD MEMBER MUNN: I second that.

BOARD MEMBER GINGERY: The motion has been made and moved. Any additional discussion?

BOARD MEMBER SKILBRED: As amended right?

BOARD MEMBER GINGERY: As amended. Thank you. Hearing none, all in favor of the approval of this document signify by saying aye.

LQD BOARD MEMBERS: Aye.

BOARD MEMBER GINGERY: Those opposed? It's approved unanimously.

BOARD MEMBER GEORGE: As Chairman of the Water and Waste Advisory Board I'd ask for a motion.

BOARD MEMBER SKINNER: I'd make a motion that we adopt the proposal as amended.

BOARD MEMBER GRAHAM: I second the motion.

BOARD MEMBER GEORGE: All of those in favor signify by saying aye.

WQD/WASTE BOARD MEMBERS: Aye.

BOARD MEMBER GEORGE: All opposed say nay. The motion is unanimously carried.